Nonactinide Isotopes & Sealed Sources Management Group (NISSMG)

Complex–Wide Resources
Solving Site Specific Problems

Plutonium ZPPR Plates leave Sandia
Nearly one-quarter of excess plutonium leaves site

Figure 1. ZPPR plates loaded to leave SNL.

On November 20, 2002 ZPPR fuel plates left Sandia to return to ANL-W for re-use in the Zero Power Physics Reactor. With this shipment nearly one quarter of Sandia's excess plutonium has been successfully dispositioned and removed from the site.

Background

The Nonactinide Isotopes and Sealed Sources Management Group (NISSMG) received a request to review disposition paths for all excess legacy materials at Sandia with a special emphasis on those having no defined path, to evaluate the materials, to define viable end states for all materials, and to provide recommendations and facilitate external interfaces for their disposition.

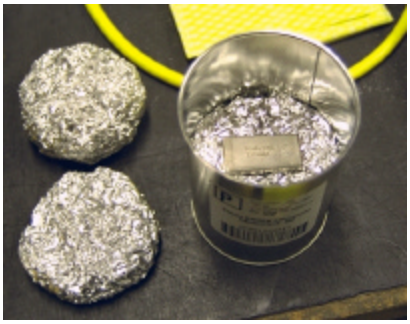

Figure 2. ZPPR Fuel Plate

One of the material categories consisted of three fuel plates from the ZPPR (Zero Power Physics Reactor) at ANL/W. The three fuel plates have total masses of 500, 91, and 70 grams. The first of these contains about 80 wt% ^{238}U and 18% ^{239}Pu. The second contains about 63% ^{238}U and 25% ^{239}Pu. And the third contains an estimated 94% ^{239}Pu and no U. Other isotopes of uranium, plutonium, and americium, and a small amount of either aluminum or molybdenum contribute the remaining mass fraction for these fuel plates.

Sandia had already repacked these items from multiple older containers into a single new 6M at the Radioactive and Mixed Waste Management Facility (RMWMF). Photographs had been taken during the repackaging process. These plates had been excess material for more than five years. Previous efforts by Sandia to get ANL-W to accept the plates back had been unsuccessful and other reuse efforts had also not been successful.

NISSMG Assistance

NISSMG reviewed the available information on these plates, contacted ANL-W and negotiated acceptance of these plates by ANL-W. The recommended disposition for this material was to package and ship it back to ANL-W for potential reuse. ANL-W completed the characterization of this fuel based upon the fuel plate serial numbers, agreed to accept this material, and was ready to receive it as soon as Sandia could ship it. NISSMG worked with ANL-W to determine packaging and shipping requirements, and supported transfer of the material to ANL-W as early as 2002.

Sandia personnel in the Risk Management / Physical Security / MC&A / NMM, the Logistics Risk Management, and the Radioactive Waste / Nuclear Material Disposition and other departments then coordinated the actual shipment of these fuel plates from Sandia to ANL-W.

Initial contact by NISSMG was in the spring of 2002 and the three ZPPR plates were shipped out of Sandia for ANL-W on November 20, 2002. With this shipment almost one quarter of Sandia's excess plutonium has been successfully dispositioned.

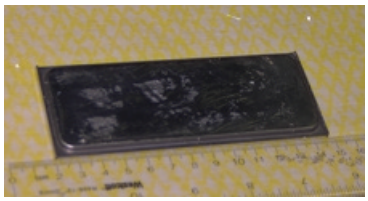

Figure 3. ZPPR Plate

Figure 5. Mock-up of 3 inner cans stacked in 2R

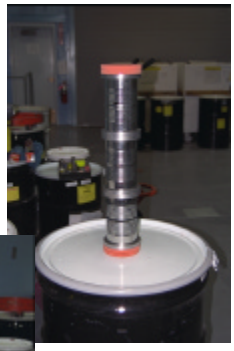

Figure 4. ZPPR plate in can loaded into 2R in 6M

Figure 6. 6M ready for shipment

Figure 7. ZPPR Plates leaving Sandia.

The Nonactinide Isotope and Sealed Source Management Group (NISSMG) provides experienced technical personnel who implement innovative solutions using complex-wide resources for site specific issues.

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